

Digital Inclusion and the Elderly: The Case of Online Banking

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Abstract

Digital inclusion is recognized as a significant issue in the UK and is affecting all aspects of the society, including access to jobs and education, community structure and services. Recent research by the BBC has found that 21% of Britain's population lack basic digital skills and as a result are not able to take advantage of the digital technology and benefit from the internet. Among this population group, the elderly users are over-represented. Worrying statistics indicate that out of the 5.9 million adults, living in the UK who have never used the Internet, 85% are over 65 years old. In this paper we study the challenges that are faced by the older generation in the digital world. We survey a group of elderly users and identify issues that prevent them from engaging with digital technology. We discuss the role of NLP for improving perception of usability and ensuring optimal experience and propose measures which would address bridging the divide.

Keywords: digital inclusion, digital divide, NLP

1. Introduction

This paper aims to identify the main factors that are causing limited adoption of digital services for elderly users, and to consider the role of NLP in defining the digital divide in modern society. We consider the case of use of online banking by people aged 65 and over in the UK.

There are many factors that cause usability issues of technology for the elderly, including ease of access, compatibility with reduced range of motor skills, limited technical skills, resistance to willingness to change, and reliance on and overly-emphasizing of prior knowledge (Czaja, 2006, Czaja, 2007, Kleinberger, 2007). A way to improve customer engagement and retention is to anticipate client concerns and improve communication by effectively addressing these concerns (Carroll, 1997). Banks and other financial institutions can use NLP to discover and parse customer sentiment, for example, by monitoring social media and analysing conversations about their services and policies. A significant proportion of senior citizens are, however, excluded in this recommendation as they are underrepresented in users of social media and online platforms (Morrell, 2002).

In this paper we discuss fear as a factor and the potential role of NLP for transforming the fear into engagement and inclusion.

The elderly represent significant proportion of the UK population. Their number of people in the UK is estimated to be 65.4 million in 2018. People, aged 65 and over amount to 11.8 million (Office of National Statistics, UK, 2018). A dominant trend is that population is continuing to age; life expectancy has improved considerably in the past 25 years and so has health care resulting in a significant number of elderly and ageing users of technology. Current trends indicate that the population is said to increase by 5.76 million by 2035 with the percentage of people over 65, rising to 24% of the total

population over the same period. In the absence of enough data relevant to the use of social media by the elderly, NLP provides an alternative channel for assessing their needs. We discuss the emergence of chatbots as a communication tool for this population group and recommend design features that would promote engagement.

The structure of this paper is as follows. In Section 2 we define the concept of digital divide and the respective categories of users of technology, affected by the divide. Factors, affecting elderly users of technology are discussed in Section 3. Steps for overcoming the divide are given in Section 4. Section 5 discusses the role of NLP.

2. Digital divide

Digital divide is defined as the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and use of the internet for a wide variety of activities (Ragnedda and Muschert, 2013). Investigation into digital divide in Europe by Brandtzæg, et. al (Brandtzæg, Heim, and Karahasanović, 2011)) studied habits, attitudes and social status of users from the most technologically advanced European countries, including Norway, Sweden, Austria, UK, and Spain. Different categories of users, based on frequency of use of technology: non users, sporadic users, instrumental users, entertainment users, and advanced users were identified. A significant percentage of the population of the advanced European countries (approximately 60%) are identified by surveys or self-identify to be either non-users or sporadic users. This indicates that advantages of using digital technologies are not accessible by a significant percentage of the population (Karahasanović, et al., 2009). These advantages include, for example, access to free and high

quality education, offered exclusively online, which would encourage acquisition of new skills and allow for development of hobbies, consequently fighting cognitive decline and providing a platform for innovation, access to digital services, essential to daily lives, such as digital payments to local authorities, online shopping, and information lookup services.

The characteristics of the technology determine whether or not it will be adopted by targeted user groups. The following user groups were identified in (Yousafzai & Yani-de-Soriano, 2012).

Laggards are defined as users who use the internet for private causes and do not use any of the e-government services. Globally, people living in France, Germany, Ireland, and the UK are classified as laggards, according to this research.

Confused and adverse. These users fit best the user group that we study. They show high variability of habits and have low usage of internet. The highest numbers of confused and adverse users have been identified in Austria and UK.

Advanced users. They show a frequent and continuous use of the Internet and use the Internet for e-commerce and for administrative tasks. Advanced users are proportionally represented best in UK, Holland and Nordic countries.

The followers. The followers tend to use the internet frequently but not on a daily basis. They also use e-government services, but do not engage in e-commerce activities as frequently, when compare with the advanced users. EU countries with comparatively high percentage of the population, identified as , are Denmark and Holland.

Non-users. 44% or the **largest** group in the research were identified or self-identified as non-users of the internet and related technologies. Predominantly, this included high percentage of population from the Southern part of Europe, geographically represented in Spain, Greece, Portugal, and Italy.

3. Influential Factors

There are many factors that case the digital divide, that are pervasive across the user groups, including

Economic factors:

Income and personal wealth are factors influencing the digital divide (Vicente and Lopez, 2011). Personal income is positively correlated to persistent digital technology infiltration rates, independent of age.

Research by Helsper and Reisdorf, (2016) compared the use of digital technologies for the uptake of digital services (including online banking) in Great Britain and Sweden. *Low income* and *unemployment* were identified as significant socio-economic characteristics in UK. In Sweden, a third factor, namely, *family status* was also identified: being single is a barrier to the uptake of digital technologies. This factor, even though of less significance

in the UK is particularly relevant for older people. The increasing number of elderly people, living alone, places them at risk of being excluded from access wide range of digital technologies and services and their respective benefits. As *non-users*, they do not see the benefits in using digital services. As people get older and retire, their earning power commonly diminishes and this causes additional issue. They perceive the computer or portable electronic devices, such as laptops, notepads or notebooks as expensive items which they cannot neither afford, not have the knowledge how to use or maintain.

Demographic factors: Age and gender

Keeping up with advancements of digital technologies is an ongoing and persistent issue for elderly people who are not IT savvy. Financial services have continuously become prevailing. With significant number of local banks closing down, due to cost cutting incentives, online banking becomes often the only option for the daily needs of an ageing population.

When considering exclusively age as a factor, researchers also focus on health-related issues, which include eyesight deterioration and coordination and motor skill issues (Vicente and Lopez, 2011), (Helsper and Reisdorf, 2011). Older users are less familiar with the technology, and their ability to adopt new technology depends on their willingness, computer self-efficacy, and dependence on prior knowledge. They have lower confidence in their own cognitive capabilities, often acting as a self-fulfilling prophecy when adopting new technologies (Yousafzai and Soriano, 2012).

Urbanization:

Internet access is cheaper and faster in urban areas in comparison to the countryside. Higher numbers of skilled and knowledgeable workers are available for support in case of technical issues (Vicente and Lopez, 2011). We identified that, while not of highest significance for the uptake of new technology, support with technical issues is a decisive factor for the elderly users. *Education and language barriers:*

Vicente and Lopez, 2011 link language barriers to technology uptake. In Scotland, part of the older generation use Gaelic which has limited language support online. Breadth of usage, self-efficacy, experience and education are also factors (Helsper & Eynon, 2010).

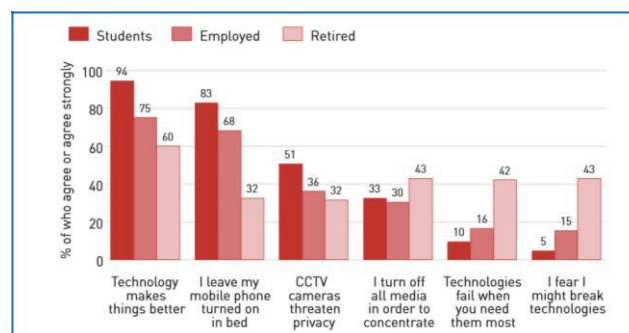


Figure 1 Age- dependent attitude to technology.

4. Overcoming the divide

Online banking offers advantages for users who live in the remote places, for example in areas, predominately populated by elderly people (in the UK one such example is the Scottish islands in the North). Most of the banks are now committed to promoting online service over the traditional methods as it beneficial. Banks, which operate exclusively online exist (see for example smile.co.uk or Monzo) and are expected to become more numerous.

The concept of digital divide is also closely linked to the generation gap, and is influenced by factors such as education, income, social mobility (IBM, 2016).

The Oxford internet survey identifies two types of users. The *next generation*, who use technology every day of their lives, and the *first generation* of users, which comprises of people who are unable to use the technology and internet services, and consists of a large proportion of retired and unemployed people. Figure 2 is adapted from the survey, and categorises 71% of retired people as *first generation* and only 29% as *next generation*.

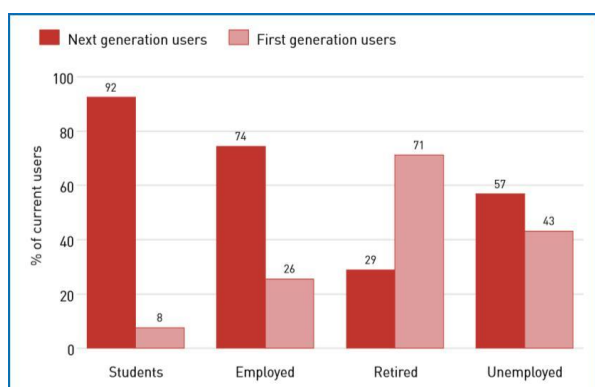


Figure 2 First versus next generation of users

We aim to determine the possible reasons for rejection and disapproval of online banking among the elderly users, focusing on factors that can be influenced by NLP. We next consider are fear and usability.

Fear of technology is excessive and disproportionate to the situation (Graham and Bronwyn, 2011). The Oxford Internet survey identified that 46% of the elderly participants strongly agreed they don't use the technology as they are scared they might 'break something' and 68% suggested it was easier to cope without using the technology.

We surveyed only people aged 65 and over, both genders were equally represented. We compared the users' attitudes towards traditional banking, which is identified as the most popular among senior citizens (Yousafzai & Yani-de-Soriano, 2012) and online banking.

88% of our respondents identified themselves as users of exclusively in-person banking. Telephone banking was

not preferred option for any of our respondents. Online banking was taken up by 12%. The reasons for using in-person banking by elderly users include the need for human interaction, the need to be sociable and the need to engage in an in-person communication to preserve cognitive functions. Our respondents identified the need to be sociable and to exchange as the most significant factor.

None of our respondents identified themselves as users of telephone banking, indicating that the usefulness of this channel is potentially decreasing. Elderly users of online banking ranked highly also *ease of use* and *safety* as dominant determining factors.

Advanced age, lower income, education and having no family support when using online banking have been identified as barrier factors for other user groups (Vicente and Lopez, 2011), (Yousafzai & Yani-de-Soriano, 2012).

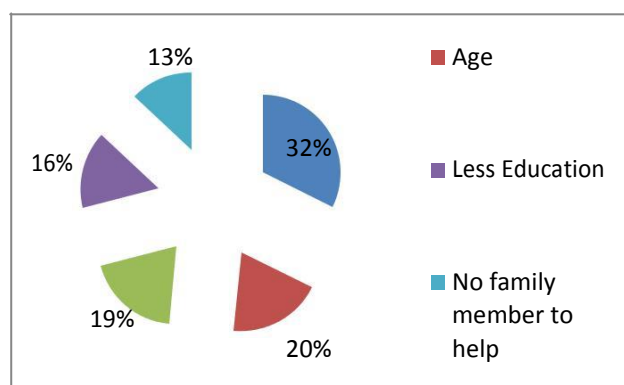


Figure 3. Factors affecting usability

Factors, affecting usability as identified by our survey respondents are given in Figure 3. Predominantly, less experience with use of online banking was the most significant factor, with 32% of the respondents indicating it as the most significant reason for avoidance. « *No family member to help* » was given as a reason for avoidance by only 13% of the respondents, indicating that the need for independence when using online banking is strong and few of the people aged 65 and over relies on a younger relative to assist them.

Not having the right experience is identified as the problem: 32% of the people identified themselves as not having the correct experience to carry out the online banking. This can be resolved by providing elderly users with access to computers, for example in community centres or local libraries and with the suitable training. 17% of the participants identified online banking as 'confusing and complicated' and 20% said age is factor for avoidance. The 'customer relations lost' were seen as an important factor among the elderly users, which resulted in them not favouring online banking.

Our survey participants are all customers of main banks in Scotland. They identified experience; trust in online banking, and banking in general, usability of website, reliability of online banking and security issues to be dominant in their reluctance to join the growing number of online banking customers (see Figure 5, which details the most significant reasons for use of traditional banking). When customers can learn to trust the online

banking systems and will start to use it. Many elderly users feared the risk of losing their physical bank to an online bank, and as a result depriving them of valued human interaction. Factors, positively affecting usability identified by our survey respondents included cheaper broadband, training, easy accessibility, easy user interface and higher awareness. A related question asked what the banks need to do in order to improve the online banking. Online security and trust was identified as essential, user friendly website in order to do their transactions and online banking.

A cheaper broadband and computer facilities and training were identified as secondary, but significant factors.

5. The role of NLP

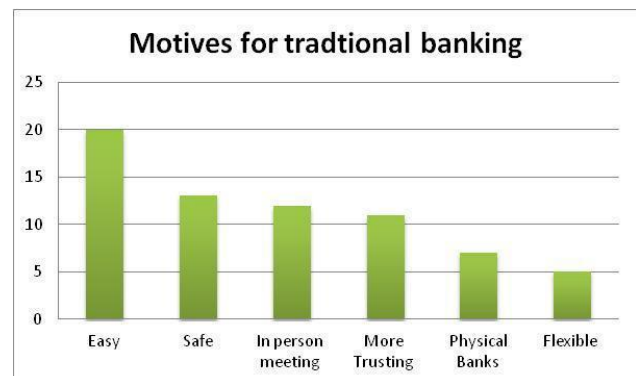
Elderly users identified the need for social interaction and assurance as decisive when using traditional banking. They indicated that online banking and digital media does not give them the same level of reassurance. One possibility to address this is providing customer reassurance by chatbots, which are becoming a ubiquitous component of the customer service. With the demand for phone banking declining, digital interactions are expected to be the preferred communication. Chatbots will enhance chat conversations by helping humans with micro-tasks and automatic replies, though it's unlikely that bots will replace humans entirely. Chatbots have been around since the 1960s and are currently used by, for example, Scottish Gas or online services such as Dell. Chatbots provide hybrid experience between human customer service agents and bots and provide a simulation to a human interaction.

Simple tasks, such as information gathering, like asking a customer for their name and account number can be carried out by chatbots, but need to be adjusted with better natural language processing to address the specific needs of elderly customers. Using machine learning techniques, the chatbots are expected to become smarter over time (IBM, 2016). The unique needs of elderly users, including better voice recognition, clearer instructions, and better responsiveness will also need to be addressed.

Small screens are another motor skill-related issue for the elderly. Reminders, sent by text messages tend to not be as effective for this reason.

Initiatives to design chatbots, specifically for the elderly exist (Formichev, 2017). In online banking services, a chatbot can assist, for example with planning of payments, reminder of outstanding transaction. Chatbots search for relevant information and present it in a suitable way, providing assistance when needed and can store communication history, which can serve as evidence of communication and transaction records. Routine communication with a chatbot and simple user interface can address if not all, at least some of the fear factors and be a simulation of a positive interaction.

Figure 5 Motives for using traditional banking



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